

NON-PUBLIC?: N

ACCESSION #: 8902280362

LICENSEE EVENT REPORT (LER)

FACILITY NAME: Wolf Creek Generating Station PAGE: 1 of 3

DOCKET NUMBER: 05000482

TITLE: Spurious Signal In Main Turbine Vibration Monitoring Circuitry

Results In Indicated High Vibration Causing Main Turbine And Reactor
Trip

EVENT DATE: 01/23/89 LER #: 89-002-00 REPORT DATE: 02/22/89

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION

50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: Merlin G. Williams - Manager Plant Support TELEPHONE #: 316-364-8831

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: On January 23, 1989, at 1322 CST, a reactor trip occurred as a result of a high bearing vibration Main Turbine trip. A Feedwater Isolation Signal, an Auxiliary Feedwater Actuation Signal, and a Steam Generator Blowdown and Sample Isolation Signal occurred as designed following the reactor trip. The required safety related equipment performed as designed. Prior to the event, the unit was in Mode 1, Power Operation, at 100 percent power.

The cause of the trip was determined to be a spurious signal in the

vibration monitoring circuitry which incorrectly indicated high vibration on the Main Turbine Number 7 bearing. To prevent additional unnecessary challenges of reactor protection systems, the turbine high vibration trip circuitry has been modified from a trip function to an alarm function. Further evaluation of the turbine vibration trip circuitry is being conducted to determine if installation of multi-coincidence logic is feasible for the trip circuitry.

There was no damage to plant equipment or release of radioactivity as a result of this event. At no time did conditions develop that may have posed a threat to the health or safety of the public.

(End of Abstract)

TEXT: PAGE: 2 of 3

INTRODUCTION

On January 23, 1989, at 1322 CST, a reactor (AB-RCT) trip occurred. The reactor trip was initiated by a Main Turbine (TA-TRB) trip caused by a spurious indication of high vibration on the Main Turbine Number 7 bearing. This event is being reported pursuant to 10CFR50.73(a)(2)(iv) as an unplanned automatic actuation of Engineered Safety Features (ESF) (JE) equipment.

DESCRIPTION OF EVENT

Prior to the trip, the unit was operating in Mode 1, Power Operation, at approximately 100 percent reactor power. Shortly before this event, computer alarms indicating high vibration on the Number 7 bearing were

received. Each subsequent alarm existed for one to two seconds before the condition cleared. By approximately 1317 CDT, the alarms were very frequent, and the Control Room operators contacted Instrumentation and Control personnel to investigate.

Shortly thereafter, at 1322 CST, the high vibration condition was again sensed and the signal persisted for the three seconds necessary to cause an automatic Main Turbine trip signal. Because the unit was operating above the P-9 permissive (50% reactor power), the Main Turbine trip initiated a Reactor trip. The subsequent Feedwater Isolation Signal, Auxiliary Feedwater Actuation Signal, and Steam Generator Blowdown and Sample Isolation Signal occurred as expected. All Engineered Safety Features equipment responded properly throughout this event. Dual indication of the position of BM HV-2, Steam Generator 'B' Blowdown Isolation Valve, was received in the Main Control Room. However, it was confirmed that the valve was in the proper (closed) position.

The Control Room operators performed the appropriate portions of emergency procedure EMG ES02, "Reactor Trip Response", to verify all automatic actions had occurred properly and to stabilize plant conditions. These activities were completed at 1328 CST, and the operators entered the normal operating procedure. By 1344 CST, the cause of the unit trip was identified as a circuitry problem in the Number 7 bearing vibration circuitry.

Following positive identification of the cause of this event, restoration of plant systems to normal configuration was initiated. The Main Feedwater

Isolation Valves (SJ-ISV) were reopened, the Startup Motor Driven Main Feedwater Pump (SJ-P) was started, and the Auxiliary Feedwater Pumps (BA-P) were secured. The reactor trip breakers (AA-BKR) were reclosed at 1550 CST; and the plant was restarted, entering Mode 1, Power Operation at 2100 CST.

TEXT: PAGE: 3 of 3

ROOT CAUSE AND CORRECTIVE ACTIONS

The cause of this event was determined to be a spurious signal in the Number 7 bearing vibration sensor loop. Following the event discussed in this report, the output of this channel was monitored for approximately two weeks with no further indication of high vibration. As a conservative measure, the probe head was replaced with a new probe head with more noise tolerance. In order to prevent further unnecessary challenges of reactor protection systems, the high vibration turbine trip circuitry was modified to provide an alarm only function rather than a trip function. Detailed procedural guidance is available to the operators for actions to be taken in the event high vibration is indicated. Turbine bearing vibration readings are being monitored using a vibration recorder. Actual turbine vibration readings were taken during the initial Main Turbine roll following the trip. These readings were then taken on a daily basis until February 16, 1989, at which time the normal schedule of weekly readings was resumed. No evidence of actual abnormal vibration was detected.

As a long term corrective action to prevent recurrence, the Main Turbine vibration circuitry trip function is being evaluated to determine if the

installation of a multi-coincidence logic is feasible. It is anticipated that this evaluation will be completed prior to January 1, 1990. The installation of multi-coincidence trip logic would prevent a single circuitry failure from unnecessarily initiating a Main Turbine trip.

The dual indication on BM HV-2 was caused by a misadjusted limit switch for the Main Control Board indication which was readjusted.

ADDITIONAL INFORMATION

Licensee Event Reports 87-004 and 87-005 discuss previous occurrences of actual high vibration on the Main Turbine. Following the events discussed in those reports, the high vibration turbine trip circuitry was modified to provide an alarm versus a trip function. As discussed in those reports, an evaluation was conducted to determine if further changes to the circuitry were required. As a result of the evaluation, the circuitry was modified to add a time delay feature to the trip circuitry. This feature was incorporated into the circuitry and the circuitry was restored to service during the plant's recent Refueling Outage, which concluded January 4, 1989. However, these actions failed to prevent the event discussed in this report.

There was no damage to plant equipment or release of radioactivity as a result of this event. At no time did conditions develop that may have posed a threat to the health or safety of the public.

NUCLEAR OPERATING CORPORATION

Bart D. Withers

President and

Chief Executive Officer

February 22, 1989

WM 89-0057

U. S. Nuclear Regulatory Commission

ATTN: Document Control Desk

Mail Station PI-137

Washington, D. C. 20555

Subject: Docket No. 50-482: Licensee Event Report 89-002-00

Gentlemen:

The attached Licensee Event Report (LER) is submitted pursuant to 10 CFR

50.73 (a) (2) (iv) concerning an Engineered Safety Features actuation.

Very truly yours,

/s/ B. D. WITHERS

Bart D. Withers

President and

Chief Executive Officer

BDW/jad

Attachment

cc: B. L. Bartlett (NRC), w/a

E. J. Holler (NRC), w/a

R. D. Martin (NRC), w/a

D. V. Pickett (NRC), w/a

P.O. Box 411 / Burlington, KS 66839 / Phone: (316) 364-8831

An Equal Opportunity Employer M/F/HC/VET

*** END OF DOCUMENT ***
